

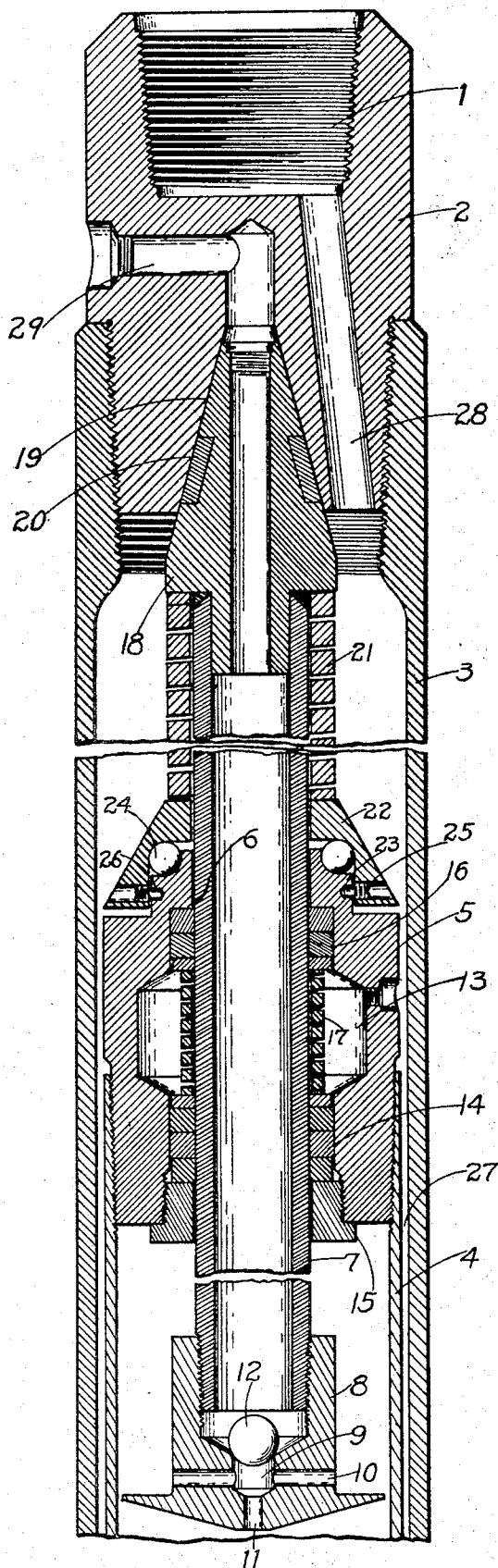
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VENT FOR CORE BARRELS

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VENT FOR CORE BARRELS

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My invention relates to vents for the upper ends of core barrels employed with core drills in well drilling.

It is now common to employ a core barrel to receive the sample cut by a core drill and to provide a valve or other vent at the upper end of the barrel which will allow the escape of fluid trapped in the barrel above the core and yet prevent the flushing fluid from flowing through the barrel from above and washing away the core. It has been found, however, that when high pump pressure is used, the pressure of the flushing liquid upon the valve tends to hold it closed so that no vent is allowed outwardly from the upper end of the barrel. The flushing fluid holds the valve so tightly seated that no outlet for the trapped fluid in the barrel is possible.

It is an object of my invention to provide an escape for the fluid in the core barrel to the outside of the drill where the pump pressure will not oppose the opening of the valve.

I also desire to provide a vent from the core barrel to the outside which may be easily adapted for use with core barrels of slightly varying lengths.

A further object is to provide a stationary outlet from the core barrel but arranged to allow the relative rotation of the core barrel in the assembly and operation of the drill.

In the drawing herewith is shown a central vertical section through the upper end of the core barrel showing my invention thereon.

The drill stem, not shown, is to be connected with the socket 1 in the upper end of the special coupling 2 which is engaged at its lower end within the nipple or working barrel 3 to which the core bit is attached.

The core barrel extends from the bit upwardly, the upper end being shown at 4. This end is screwed upon a head 5 which is a tubular block, or fitting, of approximately the same outer diameter as the core barrel. The tubular passage 6 through the block allows the insertion therethrough of the vent tube 7.

The vent tube is a pipe section, the lower end of which projects below the block 5, and

the lower extremity is threaded to receive the cap 8 which forms a guard and valve housing. It has a central opening 9 therein, which connects with lateral branches 10, and an axial channel 11. The central passage 9 is closed by the upwardly opening ball valve 12.

The tube fits slidably within the head 5. There is a central chamber 13 in the head and a stuffing box is provided on opposite ends of this chamber. Packing rings 14 below are supported upon a gland 15. The rings 16 above the chamber bear against the upper end of the recess into which they are fitted. A spring 17 between the two stuffing boxes holds the packing resiliently in position. The recess 13 is filled with grease.

Above the head 5 the tube is connected with an upwardly tapered head 18 shaped to engage within a mating recess 19 in the coupling block 2. The outer surface of the head is recessed to receive a packing ring 20 to make a fluid seal in the recess. The tube and head are held resiliently within the seat 19 by means of a coiled spring 21 fitted around the tube, and bearing at its upper end against a shoulder on the head 18 and at its lower end against a ring 22. Said ring is shaped to engage over a projecting end 23 upon the block 5, and cooperates therewith to form a bearing race for the ball bearings 24. The ring 22 is held in position on said bearings also by pins 25 on the ring engaging within an annular groove 26 in the projection 23.

The upper coupling 2 has a longitudinal liquid passage 28 therethrough for the flushing fluid which may flow around the core barrel through the space 27 to the drill. There is also an outlet passage 29 from the upper end of the conical recess 19 to the outside of the coupling 2 into the well.

In assembling my device for use, the parts including the core barrel 4 with the head 5 and tube 7 are assembled together as shown and inserted into the nipple 3 for engagement of the tapered head 18 with the coupling 2. A connection is then made with the drill and in the rotation necessary for this purpose, the tube 7 may be stationary

while the core barrel rotates due to the bearing connection 24.

The arrangement whereby the tube 7 may have a large amount of vertical adjustability makes it possible to use the vent with different lengths of core barrel without any further provision for accurate and fluid tight engagement between the vent and the barrel. Fluid from the core barrel will be balanced due to the opening 29 to the well bore and escape of fluid from the upper end of the barrel will be easily accomplished at all times.

What I claim as new is:

1. A drill nipple, a coupling block thereon, a core barrel in said nipple, a tube having a longitudinally slidable and fluid tight engagement in the upper end of said core barrel, an upwardly opening valve at the lower end of said tube, and a head on said tube fitted resiliently within a recess in said coupling block, means to hold said head normally in said recess, said recess having an opening outside said nipple but closed from the upper end of said block.

2. A drill nipple, a coupling block at the upper end thereof, having an upwardly tapered recess thereon, and an opening laterally therefrom, a core barrel in said nipple, a head on said core barrel, a vent tube slidable axially in said head, a packing member on said tube, means to force said member into said recess, said tube being rotatable relative to said head, and a valve at the lower end of said tube.

3. A drill nipple, a coupling block at the upper end thereof, having an upwardly tapered recess thereon, and an opening laterally therefrom, a core barrel in said nipple, a head on said core barrel, a vent tube slidable axially in said head, a packing member on said tube, a spring tending to move said tube upwardly in said head, and a valve at the lower end of said tube.

4. A drill nipple, a coupling block at its upper end, a core barrel in said nipple, a tube having a fluid tight sliding fit in the upper end of said core barrel, a tapered head on said tube adapted to fit a smooth, conical recess in said coupling block, there being a vent through said tapered head, and said coupling block to the outside of said block, said recess being closed from the space above said block, and an upwardly opening valve in said tube.

5. A drill nipple, a coupling block at its upper end, a core barrel in said nipple, a tube having a fluid tight sliding fit in the upper end of said core barrel, a tapered head on said tube adapted to fit a recess in said coupling block, there being a vent through said tapered head and said coupling block to the outside of said block and means to hold said tapered head resiliently in said recess.

6. A drill stem, a coupling block thereon, a core barrel, a head thereon, a tube slidable therein, a recess in the lower side of said

block connected with the outside thereof, a spring to move said tube into said recess, and means to preserve a fluid seal about said tube in said head.

7. A drill stem, a coupling block thereon, a core barrel, a head thereon, a tube slidable therein, a recess in the lower side of said block, connected with the outside thereof, a spring to move said tube into said recess, and means to preserve a fluid seal about said tube in said head, and means to prevent downward flow of liquid in said tube.

In testimony whereof I hereunto affix my signature, this 15th day of July A. D. 1931.

LOUIS H. WELLENSIEK.